DYESS AIR FORCE BASE

MIDAIR COLLISION AVOIDANCE (MACA) HANDBOOK

February 2006

Additional information about Dyess AFB can be viewed at:

http://www.dyess.af.mil/main/main.htm

INFORMATION CONTAINED IN THIS HANDBOOK IS SUBJECT TO CHANGE, AND IS NOT TO BE USED FOR NAVIGATIONAL PURPOSES.

CONSULT CURRENT FLIGHT PLANNING DOCUMENTS FOR THE LATEST INFORMATION.

TABLE OF CONTENTS

I. Introduction

II. Dyess AFB Aircraft
- B-1B Lancer
- C-130 Hercules

III. Transient Military Aircraft
- T-37 Tweet
- T-38 Talon
- T-1 Jayhawk
- T-6A Texan II

IV. Local Air Traffic Control
- Forth Worth Center
- Abilene Approach/Departure Control
- Dyess Tower

V. Dyess AFB Operations
- Departure Routes
- Arrival Routes
- B-1B Operations
- C-130 Operations

VI. Abilene Civil Training
- TSTC Air Academy
- Big Country Aviation

VII. Air Space Information

VIII. MACA Tips

IX. Contact Information

I. Introduction

Military flight operations are unique because the type aircraft, operating areas, and missions flown are unique. As a result, the more you know about military flight operations and the more that you apply that knowledge, the greater your chances of avoiding a midair collision with a military aircraft.

The purpose of this booklet is to provide you with a solid foundation of knowledge regarding military flight operations of aircraft based at Dyess Air Force Base (AFB). Although the information you'll read here is specific to the aviation activities of this airfield and the Abilene area, the principles will apply to virtually any area that has a military flying unit present.

The information contained in this booklet summarizes the type of aircraft, operating areas, and missions flown by the aircraft based at Dyess AFB. It also summarizes available radar and air traffic control services, highlights other local aircraft operators, and provides tips to help you see and avoid others who share the sky with you.

Dyess AFB is located approximately 10 miles west of the Abilene Regional Airport. Boeing B-1B bombers and Lockheed C-130 cargo aircraft are based here. Frequent transient aircraft at Dyess include the T-1, T-6, T-37, and T-38 trainer aircraft.

This booklet is provided free of charge as a service to those who are willing to take the initiative to learn about the flying activities of Dyess AFB. Additional copies provided by calling or writing the 7th Bomb Wing Flight Safety Office (7BW/SEF) at:

7BW/SEF (MACA)
597 Louisiana Loop Bldg 9203
Dyess AFB, TX 79607
(325) 696-5597/1431
Cell 325-669-5208

II. Dyess AFB Aircraft

B-1B Lancer

Mission

The B-1 is a multi-role, long-range bomber, capable of flying intercontinental
missions without refueling, then penetrating present and predicted sophisticated enemy defenses. It can perform a variety of missions, including that of a conventional weapons carrier for theater operations.

General Characteristics

Builder: Rockwell International, North American Aircraft
Power Plant: Four General Electric F-101-GE-102 turbofans with afterburner
Thrust: 30,000-plus pounds with afterburner, per engine
Length: 146 feet
Wingspan: 137 feet extended forward, 79 feet swept aft
Height: 34 feet
Weight: Empty, approximately 190,000 pounds
Maximum Takeoff Weight: 477,000 pounds
Speed: 900-plus mph (Mach 1.2 at sea level)
Ceiling: Over 30,000 feet
Crew: Four (two pilots, offensive and defensive systems officers)

C-130
Hercules

Mission

The C-130 Hercules primarily performs the intra-theater portion of the airlift mission. The aircraft is capable of operating from rough, dirt strips the prime transport for dropping troops and equipment into hostile areas

General Characteristics

Manufacturer: Lockheed Aeronautical Systems Company
Power Plant: Four Allison T56-A-15 turboprops
Thrust: 4300 horsepower per engine
Length: 97 feet, 9 inches
Height: 38 feet, 3 inches
Wingspan: 132 feet, 7 inches
Speed: 374 mph (Mach 0.57) at 20,000 feet (6,060 meters).
Ceiling: 33,000 feet with 100,000 pounds payload.

Crew: Five - two pilots, a navigator, flight engineer and loadmaster

III. Transient Military Aircraft

T-37 Tweet

Mission

The T-37 Tweet is a twin-engine jet used for training undergraduate pilo in fundamentals of aircraft handling and instrument, formation, and nig flying.

General Characteristics

Manufacturer: Cessna Aircraft Co.
Power Plant: Two Continental J69-T-25 turbojet engines
Thrust: 1,025 pounds per engine
Length: 29 feet, 3 inches
Height: 9 feet, 2 inches
Wingspan: 33 feet, 8 inches
Maximum Takeoff Weight: 6,625 pounds
Speed: 360 mph (Mach 0.4 at sea level)
Ceiling: 25,000 feet
Range: 460 miles
Crew: Two, student pilot and instructor pilot

T-38 Talon

Mission

The T-38 Talon is a twin-engine, high-altitude, supersonic jet trainer use
primarily for undergraduate pilot and pilot instructor training. A modifie
version, the AT-38B, is used to prepare pilots for fighter aircraft. This m
carries external armament and weapons delivery equipment for training

General Characteristics

Manufacturer: Northrop Corp.
Power Plant: Two General Electric J85-GE-5 turbojets with afterburner
Thrust: 2,900 pounds in afterburner, per engine
Length: 46 feet, 4 1/2 inches
Height: 12 feet, 10 1/2 inches
Wingspan: 25 feet, 3 inches
Maximum Takeoff Weight: 12,500 pounds
Speed: 812 mph (Mach 1.08 at sea level)
Ceiling: 50,000 feet
Range: 1,000 miles (870 nautical miles)
Crew: Two, student pilot and instructor pilot

T-1 Jayhawk

Mission

The swept wing T-1A is a version of the Beech 400A. The T-1 is a medium-range, twin-engine jet trainer. It is used during undergraduate pilot training to train student pilots to fly airlift or tanker aircraft.

General Characteristics

Manufacturer: Raytheon Corp.
Power Plant: Two Pratt and Whitney JT15D-5 turbofan engines
Thrust: 2,900 pounds per engine
Length: 48 feet, 5 inches
Height: 13 feet, 11 inches
Wingspan: 43 feet, 6 inches
Speed: 538 miles per hour (Mach .73)
Ceiling: 41,000 feet
Maximum Takeoff Weight: 16,100 pounds
Range: More than 2,100 nautical miles
Crew: Three (pilot, co-pilot, instructor pilot) plus observer

T-6A Texan II

Mission

The T-6A Texan II is a single-engine, two-seat primary trainer designed to train Joint Primary Pilot Training, or JPPT, students in basic flying skills common to U.S. Air Force and Navy pilots.

General Characteristics

Manufacturer: Raytheon Aircraft Co.
Power Plant: Pratt & Whitney Canada PT6A-68 turbo-prop engine
Horsepower: 1,100
Length: 33 feet, 4 inches
Height: 10 feet, 7 inches
Wingspan: 33 feet, 6 inches
Empty Weight: 6,500 pounds
Speed: 320 miles per hour
Ceiling: 31,000 feet
Range: 900 miles
Crew: Two, student pilot and instructor pilot

IV. Local Air Traffic Control

Fort Worth Center

In the Abilene area, Military Operations Areas (MOAs) are controlled by Fort Worth Center. When flying on an IFR flight plan, the controlling agency will only allow you to transit a MOA if traffic conditions permit and IFR separation can be provided between you and the aircraft in the MOA.

When flying on a VFR flight plan, it is strongly recommended that you **not** transit an active MOA due to the maneuvers, high speeds, and high closure rates of the military aircraft operating in these areas. It is possible for spins, aerobatics, stalls, and formation flying to be performed in these areas, making it highly unlikely to "see and avoid" such traffic. However, should you decide to transit an active MOA while flying on a VFR flight plan, please contact the controlling agency for traffic advisories.

For the most current information regarding MOAs in the Abilene area, to include contact frequencies, altitudes, and times, reference the current Dallas VFR Sectional chart. A chart showing the location of MOAs in reference to the Abilene area is provided on the last slide of this presentation.

When arriving into the Abilene area, expect Ft. Worth Center to pass aircraft off to Abilene Approach/Departure Control.

Abilene Approach/Departure Control

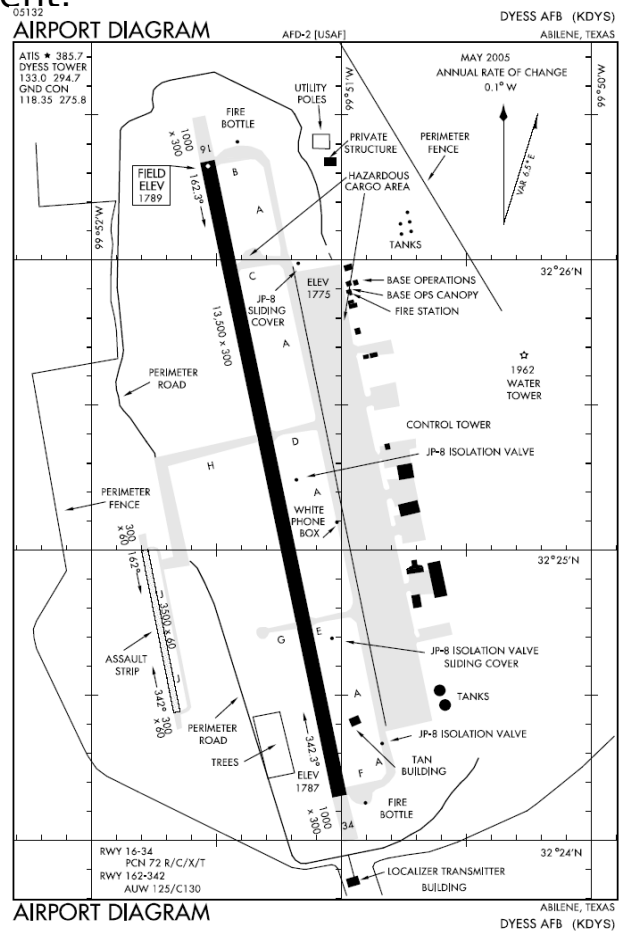
Abilene Approach and Departure controls two Class-C airspace "bubbles" which are centered on Abilene Regional Airport and Dyess Air Force Base, respectively. The inner ring of this airspace extends 5 nautical miles (nm) from each airport and the outer ring extends 10 nm. The inner ring consists of airspace from the surface up to and including 5800 MSL. The outer ring has a floor of either 3600 MSL or 4300 MSL, depending on your location. Refer to the current Dallas VFR Sectional chart for more detailed information. Pilots must establish radio contact with approach control before entering Class C airspace (5 or 10 nm rings), but it is recommended that you make contact within 20nm.

The Abilene approach controllers are invaluable to *assist* you with traffic separation and traffic advisories. However, in VMC, it is ultimately the pilot's responsibility to see and avoid other air traffic, even if you are on an IFR flight plan. Aircraft inbound to either Abilene Regional Airport or Dyess AFB can expect to be handed off to the respective airport Tower control agency during published hours of operation. Dyess AFB is closed when the Tower is not operating.

For the most accurate contact information, reference the current Airport Facilities Directory or FLIP IFR Supplement. A chart showing the Class-C airspace layout is provided on the last slide of this presentation.

Dyess Tower

Extensive flight operations can be expected within a five-mile radius of Dyess AFB. All pilots should be extremely vigilant when flying in this area. The Dyess tower provides traffic advisories on military aircraft in the vicinity of Dyess AFB for home station B-1Bs and C-130s. Additionally, transient aircraft utilize Dyess AFB for training in aircraft types including, but not limited to: T-1, T-37, T-38, T-6, KC-135, and B-52. The Dyess AFB traffic pattern is primarily to the west of the runways, **but includes all airspace within a five-mile radius of the field**. The primary traffic pattern altitude is **4000' MSL** and below. Utilizing advisories from either Dyess Tower or Abilene Approach/Departure Control will help increase traffic awareness; however, the pilot of an aircraft is never relieved of the responsibility to "see and avoid" while in VMC conditions. For the most accurate contact information, reference the current Airport Facilities Directory or FLIP IFR Supplement.



V. Dyess AFB Operations

Dyess AFB is home to the 7th Bomb Wing and the 317th Airlift Group, which conduct flight operations in B-1B bombers and C-130 airlift transports. Numerous transient military aircraft also operate around Dyess AFB on a regular basis. As a result, the airspace around this area can be congested. Much of this traffic is high speed, further reducing the ability to see and avoid.

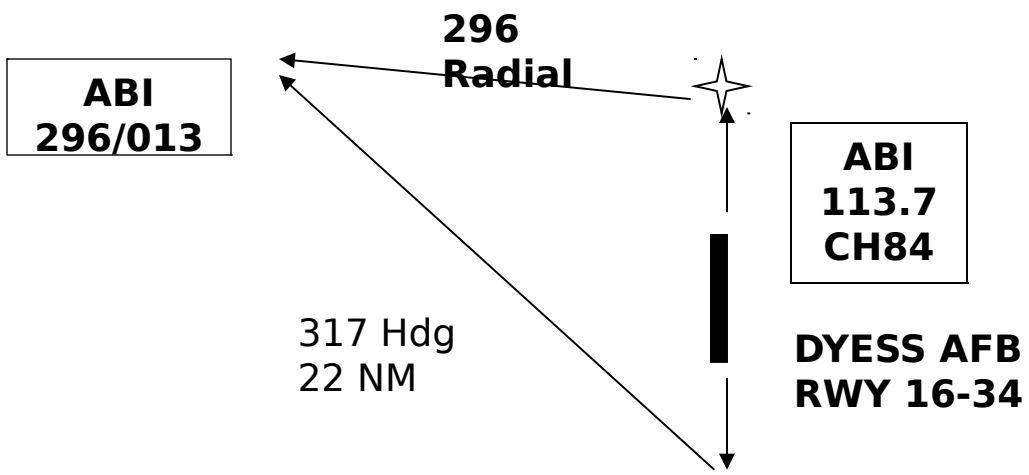
Departure Routes

Transient aircraft normally drop into Dyess for instrument approach practice and will usually leave via radar vectors. B-1B aircraft also depart the area using radar vectors. The C-130s use a standard departure, the Noodle Four Departure, to join their low altitude training routes. This routing is used primarily by formations of up to 9 C-130's, although single ship operations may also use it.

NOODLE FOUR DEPARTURE

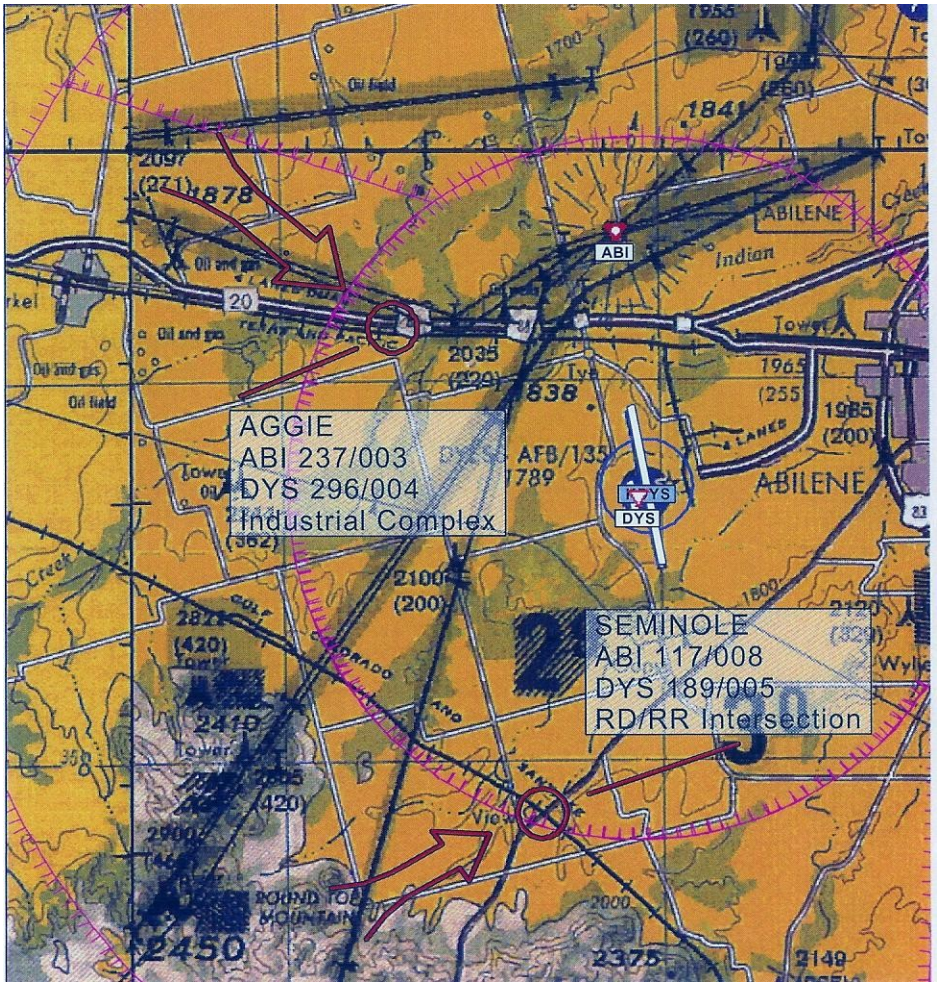
TAKE-OFF RUNWAY 16: CLIMB ON RUNWAY HEADING TO 4,000 FT MSL, TURN RIGHT HEADING 317 DEGREES DIRECT TO ABI R-296/13

TAKE-OFF RUNWAY 34: CLIMB DIRECT ABI VORTAC THEN LEFT VIA THE ABI R-296 TO 13 DME. CLIMB TO 4,000 FT MSL.



Arrival Routes

B-1B and transient aircraft normally arrive at Dyess via radar vectors. Upon arriving to Dyess, these aircraft may do multiple instrument approaches or remain in the VFR traffic pattern. Dyess C-130s typically recover VFR when returning from low altitude training routes to designated pattern entry points. The chart below shows designated entry points for the Dyess AFB traffic pattern. As stated in the Tower operations description, the traffic pattern is primarily to the west, but can include all airspace within 5 NM of the field. Additionally, high potential for conflict exists with IFR traffic in the radar pattern at 4,000 MSL extending beyond 5 NM from Dyess AFB. Many of the aircraft training at Dyess AFB such as the T-38 are small, high-speed aircraft making it difficult to see and avoid. Participation in flight following will greatly reduce the risk of a mishap.



B-1B Operations

Bombing: There are no local area ranges where B-1B aircraft drop there weapons; this is normally done at locations in Utah, Kansas, New Mexico, or others.

High Altitude Training: Dyess AFB B-1B aircraft typically depart the local area via radar vectors while climbing to the high altitude enroute structure. Local high altitude training can be accomplished in the Lancer and Brownwood MOAs. Training in these areas can encompass a variety of flight activities, many of which are at high speeds and steep climb/dive angles. It is highly recommended that VFR traffic contact the applicable controlling agency prior to entering any MOA. For the most accurate information on contact frequencies, altitudes, and hours of operation for local MOAs, reference the current Dallas VFR Sectional chart.

Low Altitude Training: B-1Bs do extensive low altitude training along published Military Training Routes (MTRs). See the slide discussing airspace information for information regarding the types and structures of MTRs. B-1Bs at low altitude normally plan to fly the routes at 540 Kts ground speed, making it very difficult to see and avoid. It is highly recommended that VFR traffic avoid low altitude flying in the vicinity of any MTR, which are shown on all VFR Sectional charts. Dyess B-1Bs regularly schedule and fly IR-178 and IR-126.

C-130 Operations

Low Altitude Training: Low altitude training routes are flown by formations and single C-130 aircraft at airspeeds of 175-250 knots. An area spanning a 100 NM radius from the Abilene VORTAC is used for low level operations from 300' - 1500' AGL. This area is termed the Low Altitude Tactical Navigation (LATN) area, and it contains multiple SRs flown by the C-130s, as well as various drop zones. Routes within this area are flown by C-130 formations both day and night and usually use minimal aircraft lighting.

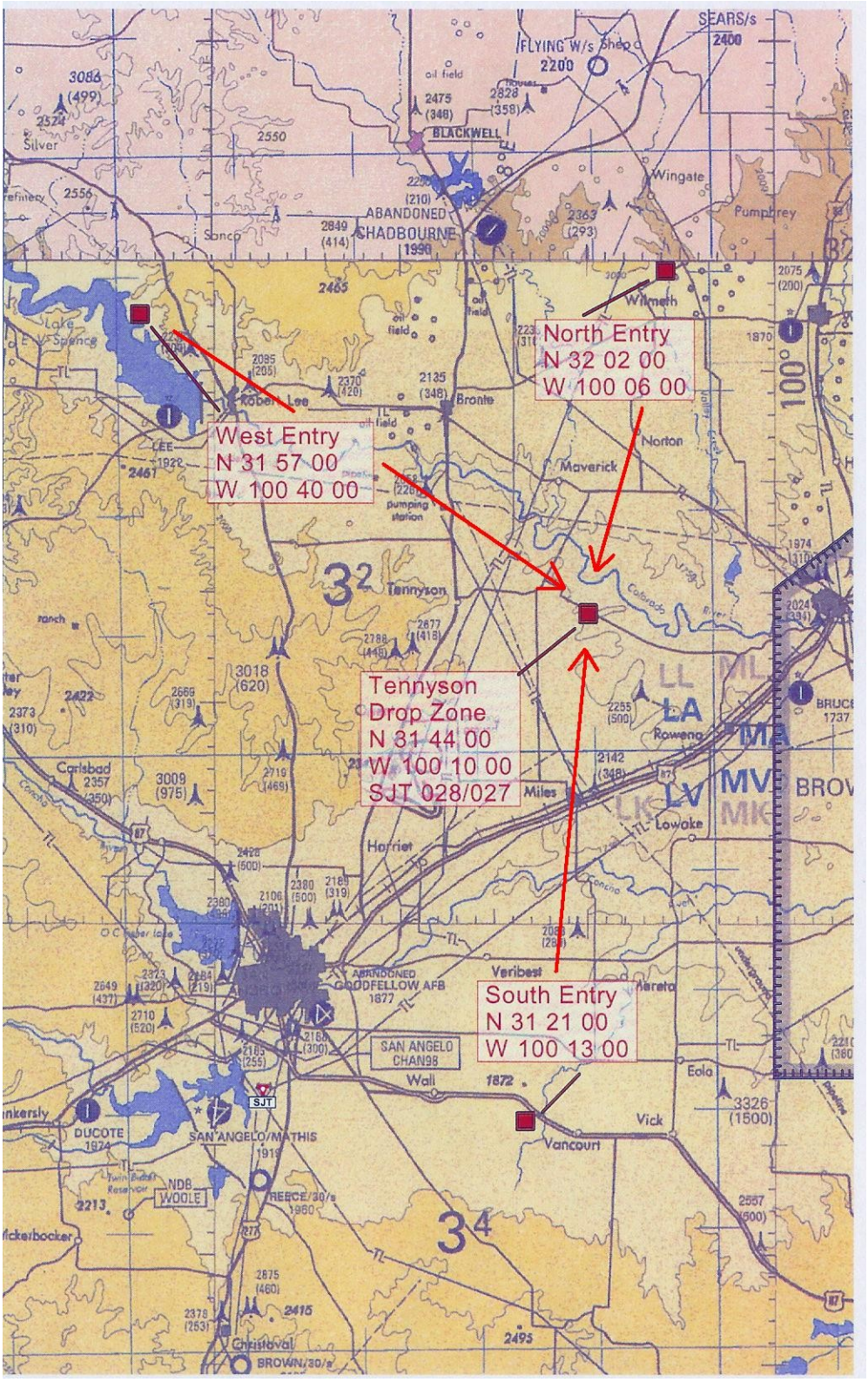
Medium Altitude Training: IFR routes are flown by C-130s to simulate IMC conditions and also to fly in actual IMC. The routes are flown up to 6000 feet MSL with an IFR clearance. Formations flying these routes can be spread several miles in length.

Air Drops: Several drop zones (DZ) within the LATN are used on a daily basis by the C-130s. Most of the training is conducted at Tennyson DZ. This DZ is located 15 miles west of Ballinger, Texas. The DZ size is 1800 x 1400 yards and is defined off the San Angelo VORTAC (SJT 028/027). A map showing the location and entry points to the DZ is provided on the following slide. The Marion DZ, which is located next to Dyess AFB (West side of runway), is also commonly used. Several others in the surrounding area are used less frequently. C-130 formations approaching these DZ's will usually be between 800 and 1200 feet AGL at 130-140 knots through the completion of their drops.

Transition Training: C-130 aircraft frequently practice touch and go's (also known as "transition training") and emergency landing procedures at several local airports. The most often used transition airports include Abilene Regional, Midland International, Mathis Field (San Angelo), Pecos Municipal, Sweetwater, Lubbock, and Brownwood. Be exceptionally vigilant when flying in the vicinity of these particular airports, and always watch for multiple aircraft.

NVG Training: C-130s occasionally do Night Vision Goggle approach and landing training at Abilene Regional Airport. During this training, Abilene's runway 17L-35R will be closed; this will be posted in the NOTAMs and on the ATIS at Abilene.

Tennyson Drop Zone



VI. Abilene Civil Training

Texas State Technical College (TSTC)

TSTC Flight academy is based at Abilene Regional Airport (ABI) and operates a total of four aircraft: two Piper Warriors, a Piper Arrow, and a Piper Seminole. TSTC normally utilizes the Gold, Blue, White, and Red local training areas as depicted on the chart on the last slide of this presentation. Along with the local areas, TSTC aircraft also do VFR and IRF cross country training to a variety of airports around the Abilene area.

Big Country Aviation

Big Country Aviation is based at Elmdale Airpark (6F4) and operates two Cessna 172 aircraft. Big Country Aviation normally utilizes the North practice area as depicted on the chart on the last slide of this presentation. The traffic pattern at Elmdale Airpark is 2300 MSL, which lies **underneath** part of the Abilene Regional Airport traffic pattern. A high potential exists for conflict in this area as VFR separation can be as little as 500'. Strict adherence to published altitudes is essential to ensure safety, as well as aggressively visually clearing the area.

Local Training Area Information

Area		**Altitude (MSL)**
North		3000-6500
Gold	2500-6500	VFR
Blue	3000-7000	IFR
White		2500-6500
Red	2500-6500	VFR, Aerobatics

VII. Airspace Information

Military Training Routes (MTRs)

Military Training Routes (MTRs) are established to accommodate enroute training operations that must be conducted in excess of 250 knots indicated airspeed and below 10,000 feet. B-1Bs flying these low level routes typically fly in excess of 600 MPH. There are three types of routes: the **Instrument Route (IR)**, where participants operate on an IFR flight plan in all weather conditions; the **Visual Route (VR)**, where participants operate VFR only and when visibility is 5 statute miles or greater; and **Slow Routes (SR)**, which are similar to VRs, except airspeed is limited to 250 knots true airspeed. The SRs are primarily used by C-130s. MTRs are depicted on sectional charts as thick gray lines with the route number in black (for example: IR-178). **CAUTION: The sectional only depicts the *centerline* of the specific MTRs! Actual route corridors may reach up to 10nm either side of the charted centerline!**

MTRs can be identified several ways. A route with **no** segment above 1,500 feet AGL shall be identified by **four** numbers, e.g., VR1107. MTRs that include one or more segments above 1,500 feet AGL will be identified by three numbers, e.g., IR178.

Military Operations Areas (MOAs)

MOAs are established for the purpose of separating certain military training activities such as air combat maneuvers, air intercepts, aerobatics, etc., from instrument flight rules (IFR) traffic. Nonparticipating IFR traffic may be cleared through a MOA when in use if IFR traffic separation can be provided. Otherwise, Air Traffic Control (ATC) will reroute or restrict IFR traffic. Pilots operating under VFR should exercise extreme caution while flying in a MOA during published hours of operation and at published altitudes encompassing the MOA's vertical limits. MOAs are depicted on sectional charts to alert VFR pilots of possible military activities. The reverse side of the sectional legend contains important information regarding times, inclusive altitudes, and controlling agencies for all the MOAs shown on that particular sectional. Additional information regarding activities in MOAs may be obtained from any Flight Service Station (FSS) within 200 miles of the area. Make it standard procedure to ask the nearest FSS about military activities within a MOA whenever your flight will be in or near

CAUTION: Due to the nature of activities conducted in MOAs, military aircraft could approach at extremely high rates of closure from virtually any angle. As a result, the ability to "see and avoid" such traffic is almost eliminated. Use good judgment when deciding to penetrate a MOA, and plan to avoid them completely whenever possible.

The MOAs nearest to the Dyess/Abilene local flying area are Lancer, Brownwood, and Westover; the chart on the last slide shows these MOAs location from Abilene. Refer to the current Dallas VFR sectional for effective altitudes and times of operation, and remember to check current NOTAMs with your local Flight Service Station.

Restricted Areas

Restricted Areas denote the existence of unusual hazards to aircraft, such as artillery firing, aerial gunnery, or guided missiles. Penetration of a restricted area without permission of the using or controlling agency may be extremely hazardous to aircraft and its occupants and is legally prohibited. The nearest restricted area to Dyess is that surrounding Gray Army Air Field near Killeen, TX.

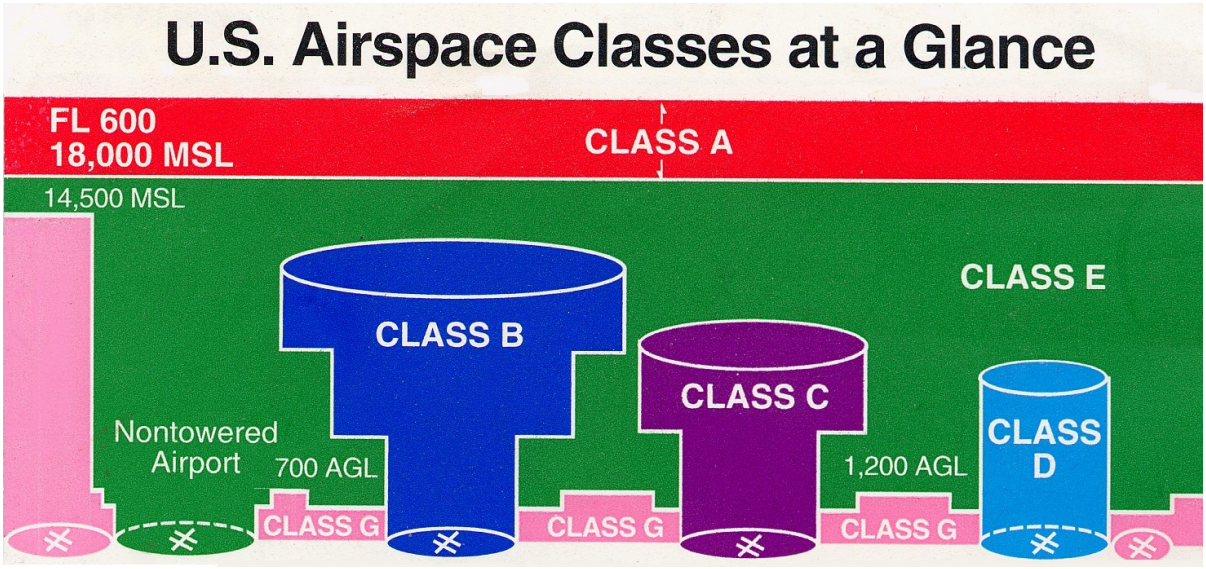
Warning Areas

Warning Areas are in international airspace (usually over water) and may contain hazards to nonparticipating aircraft. Expect to see the same type of activity that occurs in MOAs. The nearest warning area to Dyess is along the Gulf of Mexico.

Alert Areas

Alert areas contain a high volume of pilot training or similar activity. All activity within an alert area is conducted in accordance with the FARs, without a waiver requirement. Pilots of participating aircraft, as well as pilots of transient aircraft are equally responsible for collision avoidance. The Alert Area nearest to Abilene surrounds Sheppard AFB in Wichita Falls, Texas, and the Frederick Municipal Airport in Frederick, Oklahoma.

Airspace Classification



Airspace Classes	Communications	Entry Requirements	Separation	Special VFR in Surface Area
A	Required	ATC clearance	All	N/A
B	Required	ATC clearance	All	Yes
C	Required	Two-way communications prior to entry	VFR/IFR	Yes
D	Required	Two-way communication prior to entry	Runway operations	Yes
E	Not required for VFR	None for VFR	None for VFR	Yes
G	Not required	None	None	N/A

VIII. Mid Air Collision Avoidance (MACA) Ti

Statistics indicate the majority of midair collisions occur during daylight hours, in VFR weather conditions, at lower altitudes (5000 feet AGL or less), and within 5 miles of an airport. The reasons are obvious: these are the times, locations and conditions in which the heaviest flying activity occurs. Because of the congested airspace the pilot operates in and the limitations of the human eye, it becomes readily apparent that midair collision avoidance is a concern that must be addressed **before** stepping in the cockpit. Here are some concise tips that should always be reviewed before every flight:

1. KNOW HOW TO CLEAR. Many times it is emphasized that the pilot should clear, but little is said on **how** to clear. Many manuals cover scanning techniques and instructor pilots have a wealth of experience in scanning. What's important is that you know and practice your scanning pattern **every time you fly**. Some aircraft have large blind spots, requiring extra effort for a complete scan. The best scan pattern usually involves dividing the windscreen into separate segments and allowing your eyes to clear each segment momentarily before moving to the next segment. Use a momentary wingrock to help clear a blind spot created by the wing. If you receive a traffic call from the controller, and you don't immediately spot the traffic, look at a cloud or a point on the ground that approximates the distance from the traffic to help your eyes adjust to the proper focal range, then resume the traffic search. Also, if you get a call for traffic (for example, at 10 o'clock) and don't spot it, always check the opposite side (in this case, the two o'clock position) because it is easy for a busy controller to transpose the positions in the heat of battle. If you don't see the traffic, tell the controller and request traffic updates if you think the traffic will be a conflict. If you do spot traffic, you're on a collision course if the traffic does not move in the windscreen. If it does move in the windscreen, you should pass by it. This brings out an important safety tip: **Traffic on a collision course is hard to see because it does not move in the windscreen!** Finally, use the radios to help you clear. When other aircraft make position reports, listen up and clear for them appropriately.

2. MISSION PLAN POTENTIAL CONFLICTS. Know where high-density traffic areas are. This is where your knowledge of military flight operations becomes important. Review the location of military airfields, MOAs, low level routes and alert areas. Plan your flight to avoid potential conflicts to the greatest extent possible. Ensure you fly the correct altitude for direction of flight. In addition, review the airfield layout and ground references associated with your destination-- this will help you when other aircraft make position reports at that airport.

3. USE ALL AVAILABLE RADAR SERVICES. When operating in controlled airspace, it is an excellent idea to request VFR flight following for traffic advisories, even when not in radar contact. Transponder equipped aircraft should always set the appropriate codes. Ensure the altitude-encoding (Mode C) feature is on and operable. Though you may not be in radar contact with the controller, some aircraft have TCAS (Traffic Collision Avoidance System) equipment and can monitor your position and avoid you, but only if your transponder is on and operable.

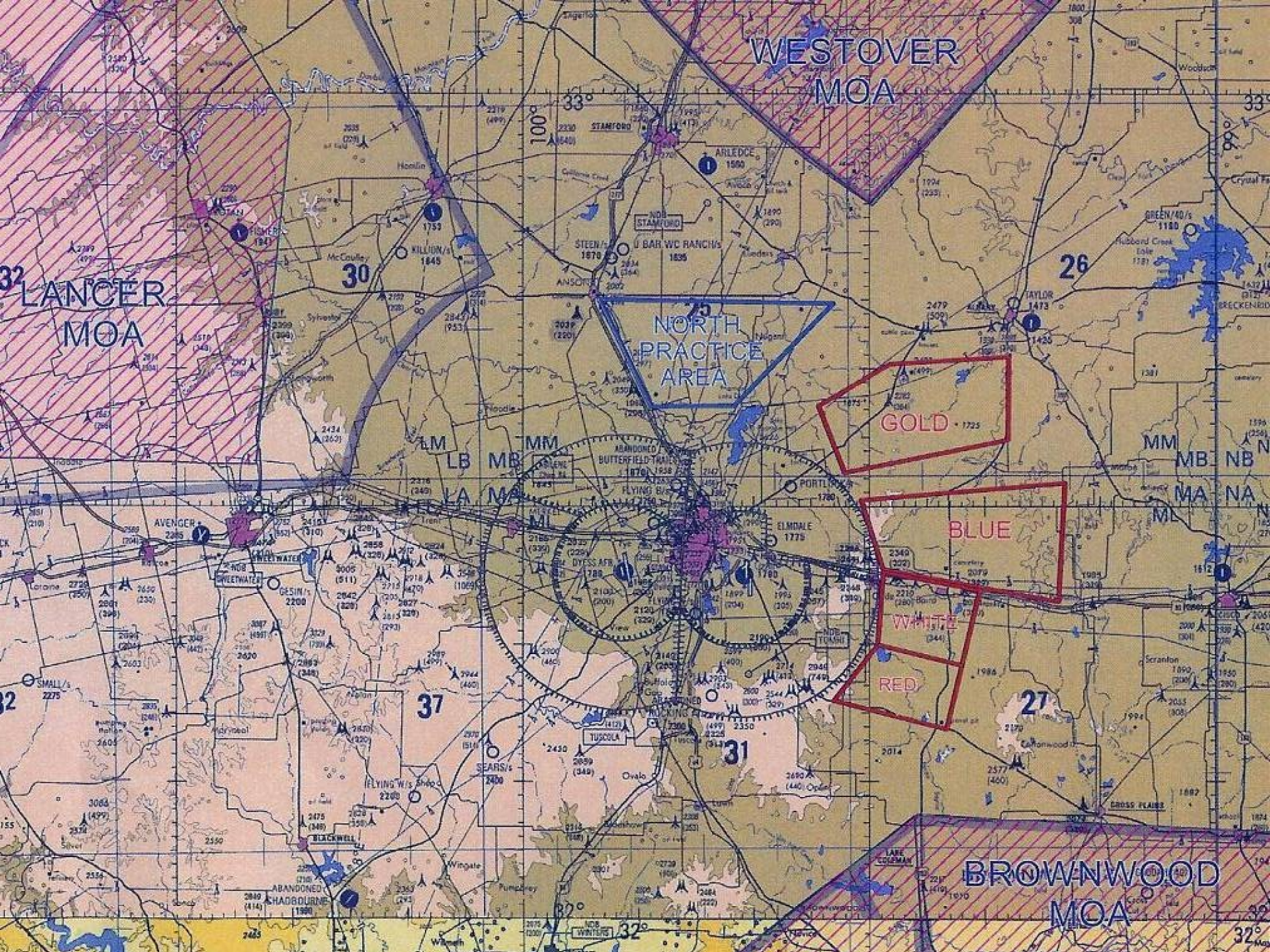
4. PRIORITIZE COCKPIT DUTIES AND STAY ALERT. Review approach plates, en-route charts, and other in-flight materials as much as possible on the ground to reduce the amount of time you are reviewing them in the cockpit during flight. When it does come time to review such materials in-flight, hold them just below the glare shield, if possible, so the periphery of your vision remains outside. This will minimize the “heads down” syndrome. Always make several clearing scans during your review of in-flight materials, and never keep your eyes inside the cockpit for an extended length of time. Prioritize your cockpit duties: **maintain aircraft control and clear FIRST!** Everything else is secondary. Stay alert by monitoring your position and the position of other aircraft around you (both visually and on the radios). As instructors, don’t get complacent! Many mid-air collisions occur during periods of instruction.

5. “SEE AND AVOID” procedures are critical for ***all*** traffic. Air traffic controllers are not required to provide separation between VFR aircraft, or even between IFR and VFR traffic under VMC conditions. They may provide traffic advisories for VFR aircraft if time and workload allow. The bottom line is this: **whenever you are not in actual IMC weather conditions, it is always *everyone’s* responsibility to clear aggressively, regardless of the type of flight plan you are on or the class of airspace you are flying in!!** Remember, there is no guarantee that everyone is flying by the rules, or that anyone is where they are supposed to be.

IX. Contact Information

We at the Dyess Wing Safety Office hope that you have found this handbook helpful and informative. If you have any questions or seek further information, please feel free to contact any of the following agencies for assistance.

Dyess Base Operator	(325) 696-3113
7th Bomb Wing Flight Safety (B-1B)	(325) 696-5597/1431 Cell 325-669-5208
317th AG Safety (C-130)	(325) 696-4049
Base Operations	(325) 696-2515/4380
Airspace Manager	(325) 696-3666
C-130 Combat Tactics	(325) 696-2793
Command Post	(325) 696-1921
TSTC Chief Instructor	(325) 671-8008
Big Country Aviation	(325) 665-7000
Abilene Approach Control / Tower	(325) 675-8254


WESTOVER
MOA
LANCER
MOA
NORTH
PRACTICE
AREA
GOLD
BLUE
WHITE
RED
BROWNWOOD
MOA